6.1.1 Classwork

Name_____ Date_____

How can I "undo" a function?
"Undo" Rules

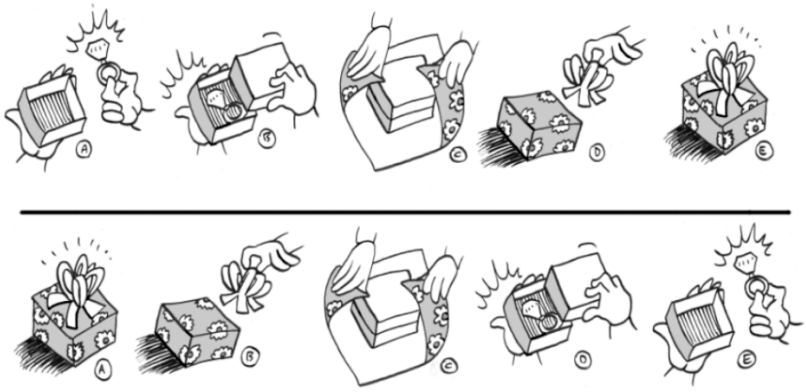
today's big goal Find rules that "undo" functions, and will develop strategies to justify that each rule undoes the other. You will also graph functions along with their inverses and make observations about the relationships between the graphs.

6-1

I'm thinking of a number that…

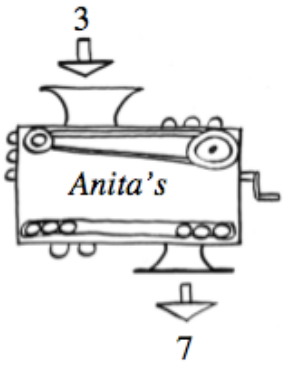
when I…	*I get…*	*I know this because…*
• triple my number and • add four		
• double my number • add four and • divide by two		
• square my number • add three • divide by two and • add one		
• double my number • subtract six • take the square root and • add four		

Reversing or Undoing:



6-2

A picture of Anita's function machine is shown at right. When she put 3 into the machine, 7 came out. When she put in 4, 9 came out, and when she put in –3, –5 came out.



a. Make a table to organize the inputs and outputs from Anita's function machine.

Anita's Function Machine	
Input x	**Output y**

Explain in words what this machine is doing to the input to generate an output:

Write a rule (equation) for Anita's original function machine:

b. **Anita's function machine suddenly starts working backwards:** it is pulling outputs back up into the machine, **reversing** the machine's process, and returning the original input. If 7 is being pulled back into this machine, what value do you think will come out of the top?

Anita sets up her new backwards function machine and enters the other ouputs. What would you expect to come out the top if 9 is entered?

If –5 is entered? Explain.

c. **Record the inputs and outputs of the backwards function machine in a table.** Record the numbers going in as *x*, and the numbers coming out as *y*.

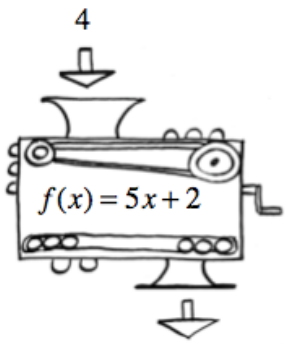
Anita's Backwards Function Machine	
Input x	**Output y**

Explain in words what Anita's backwards function machine is doing:

Write a rule (equation) for Anita's backwards function machine:

d. How are the two rules related?

6-3 The function machine at right follows the rule $f(x) = 5x + 2$



a. If the crank is turned backwards, what number should be pulled up into the machine in order to have a 4 come out of the top?

b. Keiko wants to build a new machine that will undo what $f(x)$ does to an input. What must Keiko's machine do to 17 to undo it and return a value of 3 (describe in words)?

Write your undo rule in function notation and call it $g(x)$ = _____.

c. Choose a value for *x*. Our value of x = _____.
Then find a **strategy** to show that your rule, $g(x)$, undoes the effects of the function machine $f(x)$.

6-4 Find the undo rules for each of the functions below. Use function notation and give the undo rule a name different from the original function's. **Justify** that each undo rule works for its function.

Original Function	Undo Rule	Justification that the undo rule works
$f(x) = 3x - 6$		
$h(x) = x^3 - 5$		
$p(x) = 2(x+3)^3$		
$t(x) = \frac{10(x-4)}{3}$		

6-5 Each team member should choose one function and its undo rule from the previous problem, and create multiple representations of each pair. Be sure to graph the function and its undo rule on the same set of axes.

Original Function:	**Undo Function:**
Table for Original Function:	**Table for Undo Function:**
Domain: **Range:**	**Domain:** **Range:**

When each person in your team has finished, put everyone's work into the middle of the workspace. ***Describe what relationships you see between the representations of a function and its undo rule.***

6-6 Learning Log: Finding and Checking Undo Rules

What **strategies** did your team use to find undo rules? How can you be sure that the undo rules you found are correct? Discuss this idea and then write a Learning Log entry (in your flipbook) about the **strategies** you have for finding undo rules and checking that they work. Title this entry "Finding and Checking Undo Rules".